

CURRICULUM VITAE

Nathaniel (Than) P. Hitt

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EDUCATION

- 2007 Ph.D., Virginia Polytechnic Institute and State University, Blacksburg, VA
Department of Fisheries and Wildlife Sciences
Effects of stream network topology on fish assemblage structure and biomonitoring sensitivity in the mid-Atlantic highlands
- 2002 M.S., University of Montana, Missoula, MT
Division of Biological Sciences, Organismal Biology and Ecology
*Hybridization between westslope cutthroat trout (*Oncorhynchus clarki lewisi*) and rainbow trout (*O. mykiss*): distribution and limiting factors*
- 1996 B.A., The College of Wooster, Wooster, OH
Biology, Honors
Bioremediation of strip mined soil in Mount Eaton, Ohio

PROFESSIONAL EXPERIENCE

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| 2009-present | Research Fish Biologist, US Geological Survey, Leetown Science Center |
| 2008-2009 | Postdoctoral Researcher, US Geological Survey, Leetown Science Center |
| 2007-2008 | Postdoctoral Researcher, Virginia Tech, Department of Fisheries and Wildlife Sciences |
| 2002-2007 | Graduate Research Assistant, Virginia Tech, Department of Fisheries and Wildlife Sciences |
| 1999-2002 | Graduate Research Assistant, University of Montana, Division of Biological Sciences |

RESEARCH INTERESTS

Fish population and community ecology, landscape ecology, community ecotoxicology, climate change

PUBLICATIONS

- Hitt, N.P., M. Floyd, M. Compton, and K. McDonald. *In review*. Threshold responses of blackside dace (*Chrosomus cumberlandensis*) and Kentucky arrow darter (*Etheostoma spilotum*) to stream conductivity. *Southeastern Naturalist*.
- Kanno, Y., K.C. Pregler, N.P. Hitt, B.H. Letcher, D.J. Hocking, and J.E.B. Wofford. *In review*. Seasonal temperature and precipitation regulate brook trout young-of-the-year abundance and population dynamics. *Freshwater Biology*.
- Hitt, N.P., L.K. Bonneau, K.V. Jayachandran and M.P. Marchetti. 2015. Freshwater ecosystems and biodiversity. *Lessons in Conservation* 5:5-16.
- Kanno, Y., B. Letcher, N.P. Hitt, D.A. Boughton, J.E.B. Wofford and E.F. Zipkin. 2015. Seasonal weather patterns drive population vital rates and persistence in a stream fish. *Climate Change Biology* 21:1856-1870.
- Snyder, C.D., N.P. Hitt and J.A. Young. 2015. Accounting for the influence of groundwater on thermal sensitivity of headwater streams to climate change. *Ecological Applications* 25:1397-1419.
- Hitt, N.P. and D.R. Smith. 2014. Threshold-dependent sample sizes for selenium assessment with stream fish tissue. *Integrated Environmental Assessment and Management* 11:143-149.
- Hitt, N.P. and D.B. Chambers. 2014. Temporal changes in taxonomic and functional diversity of fish communities downstream from mountaintop mining. *Freshwater Science* 33:915-926.
- Snyder, C.D., N.P. Hitt, D.R. Smith and J. Daily. 2014. Evaluating bioassessment designs and decision thresholds using simulation techniques. Chapter 9 in: Application of Threshold Concepts for Natural Resource Decision Making. G.R. Guntenspergen, ed. Springer, Pg. 157-197.
- Smith, D.R., C.D. Snyder, N.P. Hitt and P. Geissler. 2014. Monitoring for threshold-dependent decisions. Chapter 6 in: Application of Threshold Concepts for Natural Resource Decision Making. G.R. Guntenspergen, ed. Springer, Pg. 87-100.
- Smith, D.R., C.D. Snyder, N.P. Hitt, J.A. Young and S.P. Faulkner. 2012. Shale gas development and brook trout: scaling best management practices to anticipate cumulative effects. *Environmental Practice* 14:1-16.
- Hitt, N.P., S. Eyler and J.E.B. Wofford. 2012. Dam removal increases American eel abundance in distant headwater streams. *Transactions of the American Fisheries Society* 141:1171-1179.
- Hitt, N.P. and J.R. Roberts. 2012. Hierarchical spatial structure of stream fish colonization and extinction. *Oikos* 121:127-137.
- Daily, J.P., Hitt, N.P., Smith, D.R., and C.D. Snyder. 2012. Experimental and environmental factors affect spurious detection of ecological thresholds. *Ecology* 93:17-23.
- Iwanowicz, L.R., V.S. Blazer, N.P. Hitt, S.D. McCormick, D. DeVault and C. A. Ottinger. 2012. Histologic, immunologic, and endocrine biomarkers indicate contaminant effects in fishes of the Ashtabula River. *Ecotoxicology* 21:165-182.

- Hitt, N.P. and P.L. Angermeier. 2011. Fish community and bioassessment responses to stream network position. *Journal of the North American Benthological Society* 30:296-309.
- Brown, B.L., C.M. Swan, D. Auerbach, E. Campbell Grant, N.P. Hitt, K.O. Maloney and C. Patrick. 2011. Metacommunity theory as a multi-species, multi-scale framework for studying the influence of river network structure on riverine communities and ecosystems. *Journal of the North American Benthological Society* 30:310-327.
- Roberts, J.R. and N.P. Hitt. 2010. Longitudinal structure in stream fish communities: evaluating conceptual models with temporal data. *American Fisheries Society Symposium* 73:281-299.
- Betz, R., N.P. Hitt, R. Dymond and C.D. Heatwole. 2010. A method for delineating stream network topology over large geographic extents. *Journal of Spatial Hydrology* 10:15-29.
- Hodson, P., R. Reash, S.P. Canton, P. Campbell, C. Delos, A. Fairbrother, N.P. Hitt, L.L. Miller and H.S. Ohlendorf. 2010. Selenium risk characterization. In: Ecological Assessment of Selenium in the Aquatic Environment. Chapman, P.M., et al., eds. Society for Ecotoxicology and Chemistry Press.
- Hitt, N.P. and M. Hendryx. 2010. Ecological integrity of streams linked to human cancer mortality rates. *EcoHealth* 7:91-104.
- Hitt, N.P. and P.L. Angermeier. 2008. River-stream connectivity affects fish bioassessment performance. *Environmental Management* 42:132-150.
- Hitt, N.P. and P.L. Angermeier. 2008. Evidence for fish dispersal from spatial analysis of stream network topology. *Journal of the North American Benthological Society* 27:304-320.
- Hitt, N.P. and B.R. Murphy. 2007. An inquiry-based case study for conservation biology. *Journal of Virginia Science Education* 2:43-50.
- Hitt, N.P. and P.L. Angermeier. 2006. Effects of adjacent streams on local fish assemblage structure in western Virginia: implications for biomonitoring. *American Fisheries Society Symposium* 48:75-86.
- Vignieri, S.N., E.M. Hallerman, B.J. Bergstrom, D.J. Hafner, A.P. Martin, P. Devers, P. Grobler and N.P. Hitt. 2006. Mistaken view of taxonomy undermines conservation of an evolutionarily distinct mouse: a response to Ramey et al. *Journal of Animal Conservation* 9:237-243.
- Allendorf, F.W., R. Leary, N.P. Hitt, K. Knudsen, M. Boyer and P. Spruell. 2005. Cutthroat trout hybridization and the U.S. Endangered Species Act: one species, two policies. *Conservation Biology* 19:1326-1328.
- Hitt, N.P. and C.A. Frissell. 2004. A case study of surrogate species in aquatic conservation planning. *Aquatic Conservation: Marine and Freshwater Ecosystems* 14:625-633.
- Allendorf, F.W., R. Leary, N.P. Hitt, K. Knudsen, L. Lundquist, and P. Spruell. 2004. Intercrosses and the U.S. Endangered Species Act: should hybridized populations be included as westslope cutthroat trout? *Conservation Biology* 18: 1203-1213.

Hitt, N.P., C.A. Frissell, C.C. Muhlfeld and F.W. Allendorf. 2003. Spread of hybridization between native westslope cutthroat trout, *Oncorhynchus clarki lewisi*, and non-native rainbow trout, *O. mykiss*. *Canadian Journal of Fisheries and Aquatic Sciences* 60:1440-1451.

Hitt, N.P. 2003. Immediate effects of wildfire on stream temperature. *Journal of Freshwater Ecology* 18:171-173.

TECHNICAL REPORTS

Hitt, N.P. 2014. Landscape modeling of Kentucky arrow darter (*Etheostoma spilotum*) occurrence and response to water quality parameters. Report to US Fish and Wildlife Service. US Geological Survey, Leetown Science Center. 34 p.

Iwanowicz, D.D., Iwanowicz, L.R., Hitt, N.P., and T.L. King. 2013. Differential expression profiles of microRNA in the little brown bat (*Myotis lucifugus*) associated with white nose syndrome affected and unaffected individuals: U.S. Geological Survey Open-File Report 2013-1099, 11 pg.

Jastram, J.D., Snyder, C.D., Hitt, N.P., and K.C. Rice. 2013. Synthesis and interpretation of surface-water quality and aquatic biota data collected in Shenandoah National Park, Virginia, 1979–2009: U.S. Geological Survey Scientific Investigations Report 2013-5157, 77 p.

Snyder, C.D., Hitt, N.P., Young, J.A., and M.M. Rockey. 2012. Evaluating air-water temperature linkages in Shenandoah National Park streams. Report to USGS Northeast Area Region. USGS Leetown Science Center, Kearneysville WV.

Hitt, N.P., Smith, D.R., Roth, P., Brodnicki, J., Casilio, T., Gagnolet, T., Hyland, J., Kowalski, M., Maloney, K., Mead, J.V., Piekara, J., Yeager, D., Larson, M.A., Brewer, D.C. and M.C. Runge. 2011. An adaptive framework for Marcellus shale development in the Appalachian LCC. US Geological Survey and US Fish and Wildlife Service Structured Decision Making Workshop. September 12-16, 2011, National Conservation Training Center, Shepherdstown, WV.

Cummins, J., Buchanan, C., Haywood, C., Moltz, H., Griggs, A., Jones, C., Kraus, R., Hitt, N.P., and R. Villella. 2011. Potomac basin large river environmental flow needs. Final Report. Prepared for The Nature Conservancy of Maryland and the District of Columbia. 10 February 2011. Rockville, MD.

Stucker, J. and 14 co-authors. 2009. Management of wetland-riverine hydrology in Canaan Valley and Erie NWR in order to optimize biological integrity. Structured Decision Making Workshop Proceedings. National Conservation Training Center, Shepherdstown, WV.

Hitt, N.P. and P.L. Angermeier. 2007. Developing a fish bioassessment pilot project for western Virginia, USA. Prepared for USEPA Office of Wetlands, Oceans, and Watersheds. Washington, D.C.

Hitt, N.P. and L. Broberg. 2002. A river integrity assessment for western Montana. Prepared for The Wilburforce Foundation, Bozeman, MT.

Mulhfeld, C.C., Glutting, S., Wachsmuth, J., Hunt, R., Daniels, D. and N.P. Hitt. 2002. Hungry Horse Mitigation Program Investigations of the Flathead River Native Species Project. Prepared for the Bonneville Power Administration. Report # 00005049-1-R-226.

Frissell, C.A., Morrison, P.H., Adams, S.B., Swope, L.H., and N.P. Hitt. 2000. Conservation Priorities: an assessment of freshwater habitat for Puget Sound salmon. Prepared for The Trust for Public Lands, Seattle, WA.

PRESENTATIONS

Hitt, N.P. 2015. Forecasting fish population responses to climate change in Appalachia. Shepherd University Biology Department Seminar Series. Shepherdstown WV. Invited presentation. (scheduled)

Snyder, C.D., N.P. Hitt, and J.A. Young. 2015. A riverscape perspective on climate change: influence of shallow groundwater on stream thermal sensitivity and predictions for Brook Trout habitat. USGS Chesapeake Bay Program Annual Meeting. Shepherdstown, WV. Contributed presentation.

Hitt, N.P., Y. Kanno, B. Letcher and E. Snook. 2015. Seasonal temperature and precipitation related to temporal variation in brook trout abundance across the southern Appalachian mountains, USA. American Fisheries Society Annual Meeting. Portland, OR. Invited presentation. (scheduled)

Hitt, N.P., S. Eyler, and J.E.B. Wofford. 2015. Landscape-scale benefits of dam removal for American Eel restoration. American Fisheries Society Annual Meeting. Portland, OR. Invited presentation. (scheduled)

Hitt, N.P., Y. Kanno, B. Letcher, and E. Snook. 2015. Hierarchical Bayesian modeling for brook trout abundance from climate predictors. Advances in Population Ecology of Stream Salmonids – IV. Girona, Spain. Invited presentation.

Hitt, N.P., C.D. Snyder and E. Snook. 2015. Groundwater affects headwater stream response to climate warming. Annual Meeting of the Association of Mid-Atlantic Aquatic Biologists. Berkeley Springs, WV. Contributed presentation.

Kanno, Y., B. Letcher, N.P. Hitt, D.A. Boughton, J.E.B. Wofford and E.F. Zipkin. 2015. Seasonal weather patterns drive brook trout population dynamics. American Fisheries Society Southern Division Annual Meeting. Savannah, GA. Contributed presentation.

Hitt, N.P. 2014. Forecasting effects of climate change for native brook trout. Trout Unlimited, Virginia Chapter. Winchester, VA. Invited presentation.

Hitt, N.P. 2014. Brook trout research at the Leetown Science Center. Monocacy and Catoctin Watershed Alliance. Fredrick, MD. Invited presentation.

Hitt, N.P. 2014. Forecasting brook trout population responses to climate change in Appalachia. Washington and Lee University, Biology Department. Lexington, VA. Invited presentation.

Hitt, N.P. and D.B. Chambers. 2014. Temporal changes in fish communities downstream from mountaintop mining in WV. US Fish and Wildlife Service, National Energy Program. Invited presentation.

Hitt, N.P., C.D. Snyder, E. Snook. 2014. Forecasting climate change effects for native brook trout. Highlands Climate Initiative Summit. Blackwater Falls, WV. Invited presentation.

Hitt, N.P. and E. Snook. 2014. Modeling brook trout population dynamics from Maryland to Georgia. Association of Mid-Atlantic Aquatic Biologists Annual Meeting. Berkeley Springs, WV. Contributed presentation.

Cooper, K.E. and N.P. Hitt. 2014. Environmental quality relation to oocyte size in stream fish populations. West Virginia Academy of Science Annual Meeting. Shepherdstown, WV. Contributed poster.

N.P. Hitt and D.R. Smith. 2014. Sample size requirements for selenium assessment with stream fish tissue. Mid-Atlantic Regional Water Conference. Contributed poster.

N.P. Hitt, C.D. Snyder and J.A. Young. 2013. How will climate change affect brook trout habitat in National Parks? National Park Service National Capital Regional Network Science Advisory Team Meeting. Catocin Mountain Park, Thurmont, MD. Invited presentation.

N.P. Hitt. 2013. Climate change forecasting for brook trout: which streams will be resilient? Shepherdstown Rotary Club. Shepherdstown, WV. Invited presentation.

N.P. Hitt., C.D. Snyder and J.A. Young. 2013. Forecasting brook trout stream responses to climate change. Mid-Atlantic Volunteer Monitoring Conference. Shepherdstown, WV. Invited presentation.

N.P. Hitt., C.D. Snyder and J.A. Young. 2013. Modeling stream sensitivity to climate warming in Appalachia. Mountain Streams Symposium. James Madison University, Harrisonburg, VA. Invited presentation.

Angermeier, P.L., J.H. Roberts, J.C. Richard, E.A. Frimpong and N.P. Hitt. 2013. Perspectives on stream fish movement: a conceptual framework and empirical tests. Mountain Streams Symposium. James Madison University, Harrisonburg, VA. Invited presentation.

Hitt, N.P., M. Rockey, M. Compton, M. Floyd and K. McDonald. 2013. Conductivity thresholds for abundance of imperiled stream fishes. American Fisheries Society Annual Meeting. Little Rock, AK. Contributed presentation.

Wofford, J.E.B., C.D. Snyder, J.D. Jastram and N.P. Hitt. 2013. Status and trends of aquatic resources in Shenandoah National Park. Virginia Chapter of the American Fisheries Society Annual Meeting. Lexington, VA. Contributed presentation.

Evans, R., J.A. Young, C.D. Snyder and N.P. Hitt. 2013. Assessing thermal sensitivity of brook trout streams to climate change. George Wright Society Conference on Parks, Protected Areas, and Cultural Sites. Contributed presentation.

Hitt, N.P. 2013. Brook trout demography across the southern range. Eastern Brook Trout Joint Venture Annual Meeting. Frostburg, MD. Contributed presentation.

Amin, R., M. Hendryx, N.P. Hitt and M. Shull. 2013. An ecological study of associations between cancer rates and quality of air and streams. 7th International Workshop on Simulation. Rimini, Italy. Contributed presentation.

N.P. Hitt and D.B. Chambers. 2013. Downstream effects of mountaintop mining on stream fish communities. Society for Freshwater Science Annual Meeting. Jacksonville, FL. Invited presentation.

N.P. Hitt, Snyder, C.D., D.R. Smith, J. Young and S. Faulkner. 2013. Shale gas development and brook trout: scaling best management practices to anticipate cumulative effects. Society for Freshwater Science Annual Meeting. Jacksonville, FL. Contributed presentation.

N.P. Hitt. 2013. Dam removal increases headwater eel abundances: a case study from Virginia. American eel biology meeting, USGS Northern Appalachian Research Laboratory. Wellsboro, PA. Invited presentation.

Amin, R., M. Hendryx, M. Shull, A. Schoene and N.P. Hitt. 2013. Disease surveillance for cancer: an investigation of possible associations between cancer rates and quality of air and streams in Florida. American Statistical Association Annual Meeting. Pensacola, FL. Contributed presentation.

Snyder, C.D., J.D. Jastram, N.P. Hitt and K. Rice. 2012. Macroinvertebrate responses to increasing stream temperatures in Shenandoah National Park (USA). American Geophysical Union Annual Meeting. San Francisco, CA. Contributed presentation.

Hitt, N.P. 2012. Modeling spatial structure for climate change in stream ecosystems. University of Maryland-Baltimore County. Department of Geography and Environmental Systems. Baltimore, MD. Invited presentation.

Hitt, N.P., C.D. Snyder, J.D. Jastram and J.E.B. Wofford. 2012. Long-term variation in brook trout demography: effects of geology and flow history. East Coast Trout Management and Culture Workshop V. Contributed presentation.

Hitt, N.P. 2012. Stream ecology provides new indicators for public health. Duke University Integrated Toxicology and Environmental Health Program. Durham, NC. Invited presentation.

Hitt, N.P. 2012. Local and regional influences on freshwater communities: applications for community ecology and ecotoxicology. Virginia Institute of Marine Science. Gloucester Point, VA. Invited presentation.

Hitt, N.P., M. Hendryx, R. Amin and M. Shull. 2012. Ecological indicators of human cancer mortality rates: new tools for exposure and risk modeling. Environmental Mutagen Society Annual Meeting. Bellevue, WA. Invited presentation.

Hitt, N.P., C.D. Snyder and J.E.B. Wofford. 2012. Brook trout recruitment limited by stream flows. Society for Freshwater Science Annual Meeting. Louisville, KY. Contributed presentation.

Hitt, N.P., M. Hendryx, R. Amin and M. Shull. 2012. Freshwater biodiversity provides new insights for public health. University of Puget Sound, Science Seminar Series. Tacoma, WA. Invited presentation.

Andrew, R., S. Welsh, J. Young and N.P. Hitt. 2012. Natural barrier effects on trout and fish communities in Delaware Water Gap National Recreation Area. 68th Annual Northeast Fish and Wildlife Conference. Charleston, WV. Contributed presentation.

N.P. Hitt and D.B. Chambers. 2012. Selenium bioaccumulation in stream food webs. Association of Mid-Atlantic Aquatic Biologists Annual Meeting. Berkeley Springs, WV. Contributed presentation.

Amin, R., N.P. Hitt, M. Hendryx, and M. Shull. 2012. Evaluating associations between cancer rates and quality of air and streams. University of Massachusetts, Science Seminar Series. Amherst, MA. Invited presentation.

Hitt, N.P., K. Cooper, C.D. Snyder and J.E.B. Wofford. 2011. Stream fish colonization and extinction in Shenandoah National Park. Maryland Streams Symposium. Westminster, MD. Invited presentation.

Snyder, C.D., D.R. Smith, N.P. Hitt and J. Daily. 2011. Utility values and simulation to optimize bioassessment designs. Annual Meeting of the George Wright Society. New Orleans, LA. Invited presentation.

Snyder, C.D., D.R. Smith, N.P. Hitt and J. Daily. 2011. When is the best season to sample benthic macroinvertebrates in order to maximize the sensitivity of multimetric stream condition indices? 59th Annual Meeting of the North American Benthological Society. Providence, RI. Contributed presentation.

Angermeier, P.L., J.H. Roberts, E. Frimpong, N.P. Hitt, B. Albanese and P. Pegelow. 2011. Potential influences of individual mobility and habitat use on vulnerability of stream fish populations to habitat fragmentation. 141st Annual Meeting of the American Fisheries Society. Seattle, WA. Invited presentation.

Hitt, N.P. and P.L. Angermeier. 2011. West Virginia stream fish communities by zoogeography, ecoregions, and stream network position. West Virginia/Virginia Chapters of the American Fisheries Society Annual Meeting. Berkeley Springs, WV. Contributed presentation.

Hitt, N.P. 2011. Natural history of the Potomac River. Potomac Valley Audubon Society. Shepherdstown, WV. Invited presentation.

Hitt, N.P., D.R. Smith, C.D. Snyder and J. Daily. 2010. Modeling effects of rare taxa in community ecotoxicology. 95th Annual Meeting of the Ecological Society of America. Pittsburgh, PA. Contributed presentation.

Hitt, N.P., D.B. Chambers and V. Palace. 2010. Role of stream fish movement in selenium ecotoxicology. 140th Annual Meeting of the American Fisheries Society. 140th Annual Meeting of the American Fisheries Society. Pittsburgh, PA. Invited presentation.

Snyder, C.D., D.R. Smith, N.P. Hitt and J. Daily. 2010. Using simulations to evaluate the effect of taxonomic resolution on the sensitivity of macroinvertebrate based stream condition measures. 58th Annual Meeting of the North American Benthological Society. Santa Fe, NM. Contributed presentation.

Daily, J., C.D. Snyder, D.R. Smith and N.P. Hitt. 2010. Effects of sample size on threshold detection in freshwater bioassessment. 58th Annual Meeting of the North American Benthological Society. Contributed presentation.

- Hitt, N.P. and P.L. Angermeier. 2010. Spatial analysis of West Virginia stream fish communities. Annual Meeting of the West Virginia Chapter of the American Fisheries Society. Canaan Valley, WV. Contributed presentation.
- Hitt, N.P., C.D. Snyder and J. Young. 2009. Management and conservation in stream networks. 94th Annual Meeting of the Ecological Society of America. Albuquerque, NM. Invited presentation.
- Hitt, N.P. and P.L. Angermeier. 2009. Effects of regional dispersal on local fish-environment relations. 57th Annual Meeting of the North American Benthological Society. Grand Rapids, MI. Invited presentation.
- Haid, T. and N.P. Hitt. 2009. A spatiotemporal analysis of mussel habitat use in the Potomac River. Shepherd University Research Symposium. Shepherdstown, WV. Contributed presentation.
- Roberts, J.R. and N.P. Hitt. 2009. Waterfalls, chubs, and the persistence of longitudinal “succession” in stream fish communities. American Fisheries Society Student Colloquium. Blacksburg, VA. Contributed presentation.
- Snyder, C.D., D.R. Smith and N.P. Hitt. 2009. Combining thresholds and tipping points to optimize stream monitoring programs. Gordon Research Conference on Catchment Science. Andover, NH. Contributed presentation.
- Hitt, N.P. and M. Hendryx. 2009. Stream ecological integrity inversely related to human cancer mortality in West Virginia, USA. American Museum of Natural History Symposium. New York, NY. Contributed presentation.
- Snyder, C.D., Hitt, N.P. and D.R. Smith. 2009. Evaluating thresholds in stream macroinvertebrate community responses to stress. 57th Annual Meeting of the North American Benthological Society. Grand Rapids, MI. Contributed presentation.
- Roberts, J.R. and N.P. Hitt. 2008. Temporal stability of stream fish communities. 138th Annual Meeting of the American Fisheries Society. Ottawa, Canada. Invited presentation.
- Hitt, N.P. and P.L. Angemeier. 2008. Stream fish dispersal as a framework for freshwater reserves. 22nd Annual Meeting of the Society for Conservation Biology. Chattanooga, TN. Invited presentation.
- Hitt, N.P. and C.F. Saylor. 2007. Spatial relations of surface mining and fish assemblage structure in the Clinch-Powell River system, USA. Coal Impacts in the Aquatic Environment Symposium, US Fish and Wildlife Service. Abingdon, VA. Invited presentation.
- Hitt, N.P. and P.L. Angermeier. 2007. Using stream network topology as a spatial framework for fish-based assessment in the Mid-Atlantic Highlands, USA. 137th Annual Meeting of the American Fisheries Society. San Francisco, CA. Contributed presentation.
- Hitt, N.P. and P.L. Angermeier. 2007. Testing a Spatial Model of Fish Assemblage Relations to Stream Network Topology. 55th Annual Meeting of the North American Benthological Society. Columbia, SC. Contributed presentation.
- Hitt, N.P. and P.L. Angermeier. 2007. Stream sentinels: using fishes to assess environmental quality in the New River basin. New River Symposium. Radford, VA. Invited presentation.

Weaver, D., D. Orth and N.P. Hitt. 2007. Effects of Claytor Dam on downstream water temperatures and smallmouth bass. New River Symposium. Radford, VA. Invited presentation.

Kasangaki, A., M. Ogada, K. Vance-Borland, and N.P. Hitt. 2007. New international efforts for freshwater research, education, and conservation: a report from the Society for Conservation Biology's Freshwater Working Group. 2007 International Conference on Ecology & Transportation. Little Rock, AK. Contributed presentation.

Hitt, N.P. 2006. Developing a fish biomonitoring program for western Virginia. Environmental Protection Agency Fish Ecology Symposium. Cacapon Springs, WV. Invited presentation.

Hitt, N.P. and P.L. Angermeier. 2006. Effects of stream topology on fish assemblage structure in the mid-Atlantic highlands. 67th annual meeting of the Association of Southeastern Biologists. Gatlinburg, TN. Contributed presentation.

Hitt, N.P. and P.L. Angermeier. 2006. Stream network topology may affect fish assemblage responses to stress. 20th Annual Meeting of the Society for Conservation Biology. San Jose, CA. Contributed presentation.

Hitt, N.P. 2005. Stream network topology affects fish assemblage structure in western Virginia. University of Virginia Watershed Studies Seminar. Charlottesville, VA. Invited presentation.

Hitt, N.P. and P.L. Angermeier. 2004. Effects of stream network topology on fish assemblage structure in western Virginia. Virginia Mountain Streams Symposium. Charlottesville, VA. Contributed presentation.

Hitt, N.P. and P.L. Angermeier. 2004. Stream geometry and fish assemblage structure in mid-Atlantic highland streams. 134th Annual Meeting, American Fisheries Society. Madison, WI. Contributed presentation.

Allendorf, F. and N.P. Hitt. 2004. Hybridization in freshwater fishes: guidelines for assessment and conservation. Conservation Genetics Workshop on Imperiled Freshwater Mollusks and Fishes, US Fish and Wildlife Service. Shepherdstown, WV. Contributed presentation.

Hitt, N.P. and P.L. Angermeier. 2003. Use of hypothesis testing in development of fish biomonitoring tools. American Fisheries Society Student Colloquium. Morgantown, WV. Contributed presentation.

Hitt, N.P. and C.A. Frissell. 2002. Spatial and temporal patterns of rainbow trout introgression in the Flathead River system. 35th Annual Meeting of the Montana Chapter of the American Fisheries Society. Bozeman, MT. Contributed presentation.

Hitt, N.P. and C. Pringle. 2002. Consideration of upstream transport vectors in designing and managing biological reserves. 29th Annual Meeting of the Natural Areas Association. Asheville, NC. Contributed presentation.

Staley, K.B., C.J. Keleher, P.C. Marsh, W. Forbes, M. White, S. Adams, H. Blasius, N. Burkhead and N.P. Hitt. 2002. Guidelines for establishing biologically defensible recovery goals for threatened and endangered fishes under the ESA. 132nd Annual Meeting of the American Fisheries Society. Baltimore, MD. Contributed presentation.

Hitt, N.P. and C.A. Frissell. 2000. An evaluation of wilderness using Aquatic Diversity Areas in western Montana. 14th Annual Meeting of the Society for Conservation Biology. Missoula, MT. Contributed presentation.

Hitt, N.P. 1999. An evaluation of aquatic representation goals within Research Natural Areas of western Montana. 26th Annual Meeting of the Natural Areas Association. Tucson, AZ. Contributed presentation.

Hitt, N.P. and C.A. Frissell. 1999. Prioritizing aquatic conservation in western Montana with Aquatic Diversity Areas. Wilderness Science in a Time of Change Conference, US Forest Service. Missoula, MT. Contributed presentation.

FUNDED RESEARCH PROPOSALS

2015-2016. Hitt, N.P., and C.D. Snyder. "Forecasting stream habitat and brook trout responses to climate change in Catoctin Mountain Park" \$86,000.

2014-2016. Hitt, N.P., C.D. Snyder, and B.L. Letcher. "Forecasting brook trout vulnerability to climate change in Shenandoah National Park and Delaware Gap National Recreation Area." USGS-NPS National Resources Preservation Program. \$375,000.

2013-2014. Hitt, N.P., M. Floyd, and M. Thomas. "Landscape modeling of Kentucky arrow darter (*Etheostoma sagitta spilotum*) occurrence and response to water quality parameters." Collaborating institutions: USGS Leetown Science Center, USFWS Kentucky Ecological Services Field Office, Kentucky Department of Fish & Wildlife Resources. Sponsor: US Fish and Wildlife Service. \$24,000.

2013-2014. Polebitski, A.S., B.H Letcher, Y.E. Yang, K.N. Nislow, R.N. Palmer, C.M. Brown, N.P. Hitt, C. Paukert, and J. Whittier. Bringing people, data, and models together – addressing the impacts of climate change on stream temperature. Northeast Climate Science Center. \$150,000.

2012-2013. Hitt, N.P, C.D. Snyder, J. Young, and S. Faulkner. Modeling air-water temperature relations in Shenandoah National Park. Northeast Regional Office, US Geological Survey. \$103,000.

2011-2013. Hitt, N.P., D. Chambers, and T. Presser. "Evaluating selenium bioaccumulation in stream fishes of southern West Virginia." Collaborating institutions: USGS Leetown Science Center, USGS West Virginia Water Science Center, USGS National Research Program. Sponsor: West Virginia Department of Environmental Protection. \$100,000.

2010-2013. Snyder, C.D., J. Young, D. Smith, N.P. Hitt, B. Letcher, and S. Welsh. "Brook trout (*Salvelinus fontinalis*) distribution and genetic integrity in the Delaware Water Gap National Recreation Area: modeling the interactive effects of water temperature and introduced trout." National Park Service. \$783,000.

2010-2012. Hitt, N.P., D. Chambers, and T. Presser. "Evaluating selenium bioaccumulation in stream fishes of southern West Virginia." Collaborating institutions: USGS West Virginia Water Science Center, USGS National Research Program. West Virginia Department of Environmental Protection. \$394,000.

2009-2010. Hitt, N.P. and R. Villella. "Environmental Flows analysis for the Potomac River basin, USA." The Nature Conservancy and the Interstate Commission on the Potomac River Basin. \$20,000.

2008-2009. Hitt, N.P., J. Waldon, and J. Jones. "Biomonitoring for the Rocky Mount Power Dam Removal Project: establishing baseline conditions." U.S. Fish and Wildlife Service. \$71,000.

2005-2006. Hitt, N.P. and P.L. Angermeier. "Developing a fish bioassessment pilot project for western Virginia, USA." Blacksburg, VA. Assessment and Watershed Protection Program Grants, U.S. Environmental Protection Agency. Office of Wetlands, Oceans, and Watersheds, Washington D.C. \$25,000.

2004-2005. Hitt, N.P. and P.L. Angermeier. "Monitoring stream quality with fish assemblage data in Virginia." U.S. Forest Service, Washington D.C. \$20,000.

2003-2004. Hitt, N.P. and P.L. Angermeier. "Testing stream fish bioassessment methods in the southern Appalachian region." National Network for Environmental Management Studies, U.S. Environmental Protection Agency, Washington D.C. \$43,000.

2001-2002. Hitt, N.P., L. Broberg, and L. Oeschli. "A river integrity assessment for western Montana." Wilburforce Foundation. \$20,000.

TEACHING EXPERIENCE

WASHINGTON AND LEE UNIVERSITY

Guest Lecturer, "Forecasting brook trout population responses to climate change in Appalachia" Interdepartmental Seminar. Dr. David Marsh, coordinator. Fall 2014.

SHEPHERD UNIVERSITY

Guest Lecturer, "Applying landscape ecology for fish conservation." ENVS 401, Conservation Ecology. Dr. Peter Vila, instructor. Fall 2008.

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Co-instructor, Ornithology. BIO 4404. Spring 2008.

Guest Lecturer, "Strategies for statistical analysis in fisheries and wildlife sciences." FIW 5444, Graduate Seminar. Dr. Michael Vaughan, instructor. Fall 2007.

Guest Lecturer, "Determinants of community structure." FIW 4614, Fish Ecology. Dr. Paul L. Angermeier and Dr. Eric Hallerman, instructors. Spring 2007.

Guest Lecturer, "Stroubles Creek and the Clean Water Act: a case study for conservation biology." FIW 4314, Conservation Biology. Dr. James Fraser, instructor. Fall 2006.

Guest Lecturer, "Using benthic macroinvertebrates for stream quality analysis." NR 1114, Introduction to Renewable Natural Resources. Dr. Richard Oderwald, instructor. Fall 2006 and 2007.

Guest Lecturer, "Learning strategies for fish database analysis." FIW 3514, Fisheries Techniques. Dr. Emmanuel Frimpong, instructor. Fall 2006.

Instructor, Conservation Biology. FIW 4314. Department of Fisheries and Wildlife Sciences. Fall 2005.

Co-instructor, Ichthyology. FIW 4424. Department of Fisheries and Wildlife Sciences. Dr. Eric Hallerman, co-instructor. Spring 2005.

Guest Lecturer, "Ecology in theory and practice." Principles of Biology. BIOL 1106. Dr. Arthur Buikema, instructor. Spring 2005.

Guest Lecturer, "Stream biomonitoring using benthic macroinvertebrates." UCCS 2984. Earth Sustainability. Dr. Barbara Bekken and Dr. Carola Haas, instructors. Fall 2004.

Guest Lecturer, "Principles of stream fish ecology for freshwater biomonitoring." FIW 4484, Freshwater Biomonitoring. Dr. Reese Voshell and Dr. Paul Angermeier, instructors. Fall 2004.

Guest Lecturer, "Freshwater biomonitoring in theory and practice." FIW 4314, Conservation Biology. Dr. James Fraser, instructor. Fall 2004.

Guest Lecturer, "Stream fish ecology: principles and methods." FIW 2324, Wildlife Field Biology, Dr. Carola Haas, instructor. Fall 2003 and Spring 2006.

Guest Lecturer, "Conservation genetics of westslope cutthroat trout in theory and practice." FIW 5114, Conservation Genetics. Dr. Eric Hallerman, instructor. Spring 2003.

UNIVERSITY OF VIRGINIA

Guest Lecturer, "An introduction to stream fish ecology." Stream Ecology, Mountain Lake Biological Station. Dr. Christine May and Dr. Scott Eaton, instructors. Summer 2007.

UNIVERSITY OF MONTANA

Co-instructor, Vertebrate Ecology and Conservation, Flathead Lake Biological Station. Dr. Chris Frissell, co-instructor. Summer 1999.

Guest Lecturer, "Implications of a recent Supreme Court ruling for the National Forest Management Act." Environmental Law for Non-Lawyers. EVST 502. Dr. Len Broberg, instructor. Spring 2000 and 1999.

OHIO UNIVERSITY

Guest Lecturer, "Politics and science interface: bull trout ecology and conservation in western Montana." Interdepartmental seminar. Spring 1999.

HONORS AND AWARDS

- Best Publication Award, *Transactions of the American Fisheries Society* (2013)
- US Geological Survey Performance Award (2013)

- US Geological Survey Performance Award (2012)
- US Geological Survey Performance Award (2011)
- US Geological Survey Performance Award (2010)
- Outstanding Graduate Student, College of Natural Resources, Virginia Tech (2006)
- A.B. Massey Award, Department of Fisheries and Wildlife Sciences, Virginia Tech (2006)
- Burd S. McGinnes Graduate Fellowship, Department of Fisheries and Wildlife Sciences, Virginia Tech (2005)
- National Network for Environmental Management Studies Graduate Research Fellowship, U.S. Environmental Protection Agency (2002)
- Cunningham Doctoral Fellowship, Virginia Tech (2002)
- Outstanding Student Paper, American Fisheries Society, Montana Chapter (2002)
- Clancy L. Gordon Environmental Scholarship, University of Montana (2000)
- Biology Department Honors and Phi Beta Kappa, The College of Wooster (1996)

PROFESSIONAL SERVICE

- Member, Science Policy Committee, North American Benthological Society (2009-present)
- Member, Southeastern Fishes Council (2009-present)
- Mentor for USGS Youth Initiative (2011)
- Member, Board of Directors, Freshwater Working Group, Society for Conservation Biology (2006-2009)
- Member, Professional Ethics and Appeals Committee, Ecological Society of America (2004-2010)
- College of Natural Resources Representative, Advisory Council on Environmental Sustainability, Virginia Tech (2004-2005)
- Chair, Science and Conservation Committee, American Fisheries Society Virginia Tech Chapter (2004-2005)
- Vice-President, American Fisheries Society Virginia Tech Chapter (2003-2004)
- Member, American Fisheries Society Endangered Species Committee (2001-2002)
- President, Montana Student Chapter Society for Conservation Biology (2000-2001)
- Member, Central Appalachian Working Group, Forest Stewardship Council (1997-1998)

MEDIA

“Mountaintop removal for coal hurts water quality and harms fish, study says”

The Washington Post

July 13, 2014

http://www.washingtonpost.com/national/health-science/mountaintop-removal-for-coal-hurts-water-quality-and-harms-fish-study-says/2014/07/13/0072f69e-0783-11e4-bbf1-cc51275e7f8f_story.html

“In West Virginia, mountaintop mining is causing fish species to disappear”

The Columbus Dispatch

July 20, 2014

<http://www.dispatch.com/content/stories/insight/2014/07/20/deadly-fallout.html>

“How will brook trout respond to climate change?”

West Virginia Public Broadcasting

July 13, 2014

<http://wvpublic.org/post/how-will-brook-trout-respond-climate-change>

“West Virginia fish populations dwindle in streams impacted by mountaintop mining”

Bloomberg News

July 3, 2014

<http://www.bloomberg.com/news/2014-07-03/west-virginia-fish-populations-dwindle-in-streams-impacted-by-mountaintop-mining.html>

“Study: mountaintop mining harms fish in streams”

Charleston Daily Mail

July 1, 2014

<http://www.charlestondaily.com/article/20140701/DM01/140709964>

“Mining reduces fish population, new study says”

Charleston Gazette

July 1, 2014

<http://www.wvgazette.com/article/20140701/GZ01/140709912/1419>

“Freshwater Science: fish studies show mining impact”

Cumberland Times-News

July 2, 2014

<http://www.times-news.com/local/x1760119997/Freshwater-Science-Fish-studies-show-mining-impact>

“Researchers say WV fish population down from mountaintop mining”

State Journal

July 2, 2014

<http://www.statejournal.com/story/25924513/researchers-say-wv-fish-population-down-from-mountaintop-mining>

“Fish populations down due to mountaintop mining”

ScienceBlog.com

July 2, 2014

<http://scienceblog.com/73115/fish-populations-due-mountaintop-mining/>

“Mountaintop mining linked to declining fish populations – USGS”

Greenwire

July 1, 2014

<http://www.eenews.net/greenwire/2014/07/01/stories/1060002230>

“Researchers say WV fish population down from mountaintop mining”

WBOY

July 3, 2014

<http://www.wboy.com/story/25924513/researchers-say-wv-fish-population-down-from-mountaintop-mining>

“American eels benefit from dam removal in Virginia”

Earthsky.org

Aug 17, 2012

<http://bit.ly/W9cQsp>

“Dam goes down, eels go up”

Discovery News

August 15, 2012

<http://news.discovery.com/earth/dam-goes-down-eels-go-up-120815.html>

“The revival of the American eel”

Environmental News Network

August 1, 2012

http://www.enn.com/enn_original_news/article/44744

“Study: dam removal helped eels in Shenandoah National Park”

July 31, 2012

Washington Examiner

<http://bit.ly/Sjr0K7>

“American eels: freshwater species of the week”

National Geographic News Watch

August 3, 2012

<http://newswatch.nationalgeographic.com/2012/08/03/american-eels-freshwater-species-of-the-week/>

“Stream quality is linked to human health, study says”

West Virginia Public Radio

April 26, 2010

<http://www.wvpubcast.org/newsarticle.aspx?id=14550>

“New study links stream quality and human cancer rates”

Phys.org News

April 21, 2010

<http://phys.org/news191080428.html>

“Study links stream pollution to higher cancer rates”

Charleston Gazette

April 21, 2010

<http://wvgazette.com/News/201004210757>